WHAT IS CLAIMED IS:

1. A method for manufacturing a trench-type MOSFET, the method comprising:

providing a semiconductor substrate and forming a trench on the semiconductor substrate;

forming a first oxide layer on a bottom and sidewalls of the trench and on the semiconductor substrate;

forming a bottom anti-reflective coating (BARC) layer in the trench to cover the first oxide layer;

forming a photoresist layer on the bottom anti-reflective coating layer;

removing the photoresist layer;

removing the bottom anti-reflective coating layer; and

removing the first oxide layer on the sidewalls of the trench to form a bottom oxide layer on the bottom of the trench.

2. The method of claim 1 wherein providing the semiconductor substrate and forming the trench comprises:

forming a pad oxide layer, a silicon nitride layer, and a mask oxide layer sequentially on the semiconductor substrate; and

removing portions of the pad oxide layer, the silicon nitride layer, the mask oxide layer, and the semiconductor substrate to form the trench.

3. The method of claim 2 wherein removing the portions is performed by a photolithography process and an etching process.

4. The method of claim 2 further comprising after removing the portions:

forming a sacrificial oxide layer on the sidewalls of the trench; and

removing the sacrificial oxide layer.

5. The method of claim 4 wherein the sacrificial layer is formed by thermal oxidation.

6. The method of claim 4 wherein the sacrificial oxide layer is removed by etching.

7. The method of claim 1 wherein the first oxide layer is formed by chemical vapor deposition (CVD).

8. The method of claim 1 wherein the bottom anti-reflective layer is formed by deposition.

9. The method of claim 1 wherein the bottom anti-reflective layer is removed by etching.

10. The method of claim 9 wherein the bottom anti-reflective layer is removed by etching using a chemical compound which contains sulfuric acid.

11. The method of claim 1 wherein the first oxide layer is removed by etching.

12. The method of claim 11 wherein the first oxide layer is removed by etching using a chemical compound which contains hydrofluoric acid.

13. The method of claim 1 further comprising depositing a polysilicon layer in the trench after removing the first oxide layer on the sidewalls of the trench.

14. A method for manufacturing semiconductor devices, the method comprising:

providing a semiconductor substrate having a trench on the semiconductor substrate;

forming a first oxide layer on a bottom and sidewalls of the trench and on the semiconductor substrate;

forming a bottom anti-reflective coating (BARC) layer in the trench to cover the first oxide layer;

forming a photoresist layer on the bottom anti-reflective coating layer; and

removing the photoresist layer, the bottom anti-reflective coating layer, and the first oxide layer on the sidewalls of the trench to form a bottom oxide layer on the bottom of the trench.

15. The method of claim 14 wherein providing the semiconductor substrate having the trench comprises:

forming a pad oxide layer, a silicon nitride layer, and a mask oxide layer sequentially on the semiconductor substrate; and

removing portions of the pad oxide layer, the silicon nitride layer, the mask oxide layer, and the semiconductor substrate to form the trench.

16. The method of claim 15 further comprising after removing the portions:

forming a sacrificial oxide layer on the sidewalls of the trench; and

removing the sacrificial oxide layer.

17. The method of claim 15 further comprising depositing a polysilicon layer in the trench after removing the first oxide layer on the sidewalls of the trench.

18. A method for manufacturing semiconductor devices, the method comprising:

providing a semiconductor substrate having a trench on the semiconductor substrate;

forming a first oxide layer on a bottom and sidewalls of the trench and on the semiconductor substrate;

forming a bottom anti-reflective coating (BARC) layer over the first oxide layer, the bottom anti-reflective coating layer filling the trench;

forming a photoresist layer on the bottom anti-reflective coating layer; and

removing the photoresist layer, the bottom anti-reflective coating layer, and the first oxide layer on the sidewalls of the trench to form a bottom oxide layer on the bottom of the trench.

19. The method of claim 18 wherein providing the semiconductor substrate having the trench comprises:

forming a pad oxide layer, a silicon nitride layer, and a mask oxide layer sequentially on the semiconductor substrate;

removing portions of the pad oxide layer, the silicon nitride layer, the mask oxide layer, and the semiconductor substrate to form the trench;

forming a sacrificial oxide layer on the sidewalls of the trench; and

removing the sacrificial oxide layer.

20. The method of claim 18 further comprising depositing a polysilicon layer in the trench after removing the first oxide layer on the sidewalls of the trench.